(Claims as originally filed)

Claims

1. A process for producing polymerisates by the use of conjugated dienes and vinylaromatic compounds by anionic polymerization in an inert reaction medium in the presence of
   - at least one lithium-organic compound,
   - at least one dialkyl ether of the formula

     R^1-O-CH_2-$CH(R^3)$-O-R^2

     wherein

     R^1 and R^2 are independently of one another alkyl residues having a different number of carbon atoms, which are selected from the group comprising methyl-, ethyl-, n-, and iso-propyl, and n-, iso-, sec-, and tert-butyl, and wherein the total carbon atoms in the two alkyl residues R^1 and R^2 are 5 to 7, and

     R^3 represents hydrogen, a methyl- or an ethyl group, and
   - at least one alkali-organic compound, wherein the alkali-organic compound is employed in quantities from greater 0.5 mol per mol of lithium in the lithium-organic compound.

2. A process according to claim 1,
   characterised in that prior to or during the polymerization reaction, aromatics having several vinyl groups or alkyl aromatics having several vinyl groups are added as cross-linking couplers.

3. A process according to any one of the preceding claims,
   characterised in that at the end of polymerization the living chain ends are reacted with couplers, which are selected from the group of aromatics having several vinyl groups, alkyl aromatics having several vinyl groups, silicon tetrachloride, and tin tetrachloride.

4. A process according to any one of the preceding claims,
   characterised in that the alkali-organic compound is an alkali metal alcoholate of the formula M-OR, wherein R represents an alkyl group having 1 to 10 carbon atoms, preferably 3 bis 5, and M is sodium or potassium, preferably sodium.

5. A process according to any one of the preceding claims, **characterised** in that the alkali-organic compound is added to the polymerization mixture conjointly with the lithium-organic compound or the dialkylether in the form of a ready-for-use blend.

6. A process according to any one of the preceding claims, **characterised** in that the conjugated diene is 1,3-butadiene or 1,3-butadiene and isoprene.

7. A process according to any one of the preceding claims, **characterised** in that the inert reaction medium essentially consists of cyclo-hexane and/or hexane.

8. A process according to any one of the preceding claims, **characterised** in that ethyl-ethyleneglycol-*tert*-butylether ($CH_3CH_2OCH_2CH_2OC(CH_3)_3$) is employed as a dialkylether.

9. A process according to any one of the preceding claims, **characterised** in that a monolithium compound having 1 to 12 carbon atoms, particularly 4 to 6, is used as a lithium-organic compound.

10. A process according to any one of the preceding claims, **characterised** in that the polymerization is carried out at 0 to 130 °C, preferably 20 to 100 °C.

11. A process according to any one of the preceding claims, **characterised** in that vinylaromatic compounds having one or more vinyl group(s) (-CH=CH_2) on the aromatic ring, preferably 8 to 20 carbon atoms, and particularly styrene are employed, such that 30 to 60 wt.% of the monomeric units in the polymerisate are vinylaromatic compounds, particularly styrene monomeric units.

12. A process according to any one of the preceding claims, **characterised** in that the lithium-organic compound is used in quantities from 0.01 to 1, preferably 0.01 to 0.2, parts per 100 parts by weight of monomer.

13. A process according to any one of the preceding claims, **characterised** in that the dialkylether is employed at a molecular ratio from 2 : 1 to 30 : 1, preferably 2 : 1 to 15 : 1, based on the number of molecules of the catalyst (referring to the lithium atoms).

14. Polymerisates obtainable according to the process of any one of the preceding claims.

15. The use of the polymerisates manufactured according to any one of claims 1 to 13 for the production of or use in silencing materials and/or tyres, particularly winter tyres and mud and snow tyres, preferably tyre treads.
